

7- 3.1 KF F1 Rotary Bored Piling Work Package Plan

1- 1.6K Project HSEQ Management



Work Package Plan

100-2400762

Etruria Stoke – Vale 1 Shaft

					Acceptance by Customer		
Version	Prepared by	Date	Approved by	Date	Required Y/N	Acceptance by	Date
Rev0		14/03/2025					
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Contents

	7- 3.1 KF F1 Rotary Bored Piling Work Package Plan	1
1	Work Package Details	3
	1.1 Description of work	3
	1.2 Excavator Duties and attendance provided by client.	3
2	Control of Activity Risks	4
3	Resources	4
	3.1 Plant 4	
	3.2 Labour	5
4	Permits	5
5	Site Details	5
	5.1 Access	5
	5.2 Logistics	6
6	Site Layout.....	7
7	Control of Site Hazards	8
8	Communication & Contact Details.....	9
9	Emergency Arrangements.....	10
	9.1 Interfaces	10
10	Environmental.....	11
	10.1 Project Impact Assessment	11
	10.2 Pollution Prevention	11
	10.3 Waste Management	12
	10.4 Unexpected Contaminated Land	12
	10.5 Coal Seams.	12
11	Briefing	14
	11.1 Briefing Arrangements	14
12	Welfare	14
13	PPE	14
14	Working At Height.....	15
15	Working Hours.....	15
16	Handover of completed works.....	15
17	Appendices	16
	17.1 Site Hazard Assessments	16
	17.2 Working Platform Certificate	17
	17.3 Hospital Route Map	18
	17.4 Site Plans & Sequence Stages.	19
	17.5 Rig Details	20
18	Detailed Methodology.....	21
	18.1 Installation of piles	21
	18.2 Setting Out Requirements – Toolbox Talk.	25

1 Work Package Details

1.1 Description of work

██████ have been contracted by ██████ to undertake the piling works at Etruria STW Detention Tank, Stoke on Trent ST1 4JX. The main contractor is ██████ with ██████ being the piling subcontractor.

This work package plan describes the methodology for the construction of a Rotary Bored Secant Shaft. Piles will be constructed using temporary casings.

- C. 75-80lm of secant shaft, utilising 1180mm rotary bored piles.
- Installation of temporary concrete guide-wall
- Setting out of guide-wall only (control points to be provided by Client).
- 4 No cubes per day (tested at 7, 28, 28 and 56 days)
- Site Storage and lifting of all reinforcement cages
- Installation of 4No Inclinometer tubes.

Main site attendances to be provided by Client are as follows:

- Full welfare and office facilities
- Setting out engineer (Full-time. Main duties to set out piles and record daily as-builts (*In abeyance*)).
- Concrete washout area
- Water supply (Hydrant located 10-20m away shaft location) – ██████ to provide lines.
- Water management & disposal – (To include pumps & relevant tanks).
- Excavator and dumper (plus operators) in attendance for removal of pile arising - (Note Excavator Duties)
- Background lighting
- Skips for site waste (segregated)
- Wheel washing/road cleaning
- Platform installation and testing
- Service scanning, demarcation, protection and/or diversion
- Additional Laydown area for ancillary piling equipment

Our works are based upon being able to track our rigs fully erect between all pile positions and all locations. Therefore, we will require ramped access to be installed, modified and maintained as necessary by others to the various piling platform levels. A maximum gradient of 1:10 is allowable when fully rigged.

Larger wagons will require a movement order and will move to site in accordance with this document.

Sequence and Stage to be demonstrated within Section 17.4

1.2 Excavator Duties and attendance provided by client.

- Trained and competent operator including relevant lifting training (This attendance will be working closely with the RBP site team and all associated equipment).
- Min tracked +13.0t excavator and must be supplied with the appropriate digging buckets and attachments for RBP piling complete with quick hitch and load hooking device.
- Specification (██████ will provide a lift plan for the excavator)
- The supplied excavator & operator are for ██████ sole use only
- Excavator operator to work to ██████ instruction and contractual hours (08:00 to 18:00 Mon-Friday) with the option of working Saturday should the contract require.
- In the event of an unplanned overrun, such as concrete delays, the excavator & operator must work to the instruction of the ██████ supervisor.
- Lifting Operations, 360 excavator pick and carry ticket
- Operator shall be briefed and signed on the ██████ RBP WPP specific to the works
- The attending excavator shall be utilised for lifting RBP piling gear Inc. general logistics, general maintenance, offloading and loading piling equipment and, reinforcement and tandem lift in conjunction with crawler crane where specified in the lift plan.

2 Control of Activity Risks

Identify significant hazards (to workers, drivers and other staff, the operational railway / infrastructure / services and to members of the public, including environment and health risks) and specify the required controls

A table should be provided detailing which risks are relevant for each task (to enable them to be identified in appropriate task briefings). An illustrative example is given below:

Risk Identified	Controls Specified	Tasks where risk needs to be briefed				
		Piling Operation	Lifting operation	Attendant excavator	Testing of piles	
Rotating machine parts	Guards to be used at all times	X		X		
Open excavations	Piles to be covered immediately following construction	X	X	X		
Lifting of cages	Operation to be carried out by slinger/signaller only.	X	X	X		
Concrete burns	PPE to be worn. Eye wash points to be identified	X		X		
Environmental	Spill kits to comprise plant nappies, spill granules, booms and drip trays	X	X			

Full hazard and COSHH assessments are available upon request, as part of the Risk Assessment Pack

3 Resources

3.1 Plant

- 1nr Crawler mounted hydraulic drilling rig - Soilmecc SR125. (2No for approx. 6 weeks)
- 1nr Attendance Crane – 80T Telescopic – Liebherr LTM1060 (2No for approx 6 weeks)
- Drill tooling
- Casings (1180mm)
- 20ft stores unit (1no per rig)
- MEWP
- Jetwash
- Water Feed from surrounding plant (supplied by client)
- Tremmie Rack
- 1No Casing Extractor + Power Pack.

All operators conducting duties with the use of the MEWP shall be in accordance with the manufacturers operating instructions at all times. All operators shall be IPAF qualified.

3.2 Labour

- Non-Working Supervisor
- Rig Operator
- Crane Operator
- Banksman (Rig)
- Pumpman/Tremmie x 2

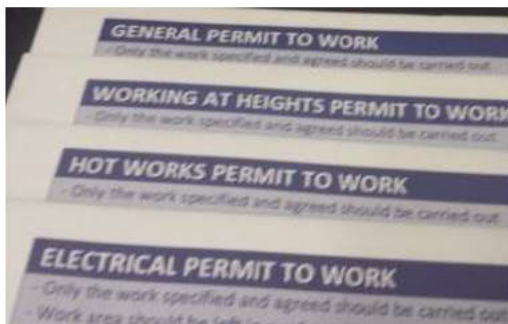


All site personnel will have as a minimum a CSCS card and where applicable a CPCS card. All personnel will have their CSCS/CPCS cards for inspection during the induction.

The Supervisor will be FPS/CITB accredited and competent to manage the works on site. The piling supervisor is qualified to the Federation of Piling Specialists Supervisor Health, Safety and Environment (H.S.E) Awareness Course (course covers all topics by Construction Skills Site Supervisors Safety Training Scheme (SSSTS)).

4 Permits

Prior to commencement of piling works, the following permits must be obtained:



- Working platform certificate - issued weekly and following any reinstatement of the platform, such as following removal of obstructions. This also needs to include the access ramps between works areas
- Client to issue Temporary Works Permit to Load for the piling platform on a weekly basis
- Permit to dig – issued to last no more than 7 working days, must be relevant to the area we are working in and must confirm there to be no services in the area.
- Coal authority permit. By others.
- Hot works permit for use of welding equipment or abrasive wheels. – Point of Work Risk Assessment to be provided by Keller Supervisor to ensure all safety measures are in place before works commence in accordance with Keller 3-3.6K Hot Works Works Instruction.

These documents must be signed by the client or his representative prior to undertaking our works. A copy of the Working platform certificate (WPC4) is attached in Appendix B.

5 Site Details

5.1 Access

As part of the enabling works [REDACTED] are creating access from Clough Street, as the access from Timmis St and Etruria Vale Road is deemed insufficient. All piling deliveries including rig, plant, and materials will use the haul road from Clough Street.

Delivery of material to site must follow the Traffic Management Plan set out by the principal contractor. All deliveries to site must obey any site speed limits or other signage. The rig will also be sent direct to site in compliance with the routing and transport movement orders.

The piling rig and attendant cranes will be mobilised to site on a low-loader using the abnormal load procedure, the approved transport routes. Due to Highways/Local Authority restrictions, the rig may be subject to out of hours delivery times. The low loader will drive to the site where the piling team will position the low-loader outside of the site ready for offloading. When the low-loader is in the correct position, the tractor unit will detach itself from the trailer and drive to a safe position away from the offloading operation.

The piling rig will be tracked into the site to an area with a firm, level platform suitable for rigging up by the piling crew.

The remaining plant and equipment will be delivered using either 40ft articulated or 28ft flat-bed rigid wagons. [REDACTED] will ensure all deliveries are pre-slung, have fall protection or can be unloaded with a telehandler.



Wagons to be pre-slung where possible
Fall protection/side rails to be used if
access to the bed of the wagon is
required

5.2 Logistics

- For access to the [REDACTED] works area, it is envisaged that all standard deliveries will follow way system identified in the Traffic Management Plan. (VALE/GEN/002).
- No deliveries occur before 8am or after 6pm unless they are abnormal loads in which case the neighbouring properties will be advised well in advance.
- Out of Hours deliveries to site are to be notified in advance
- Restricted zones will be formed around piling areas by use of crowd control barriers which will move with the piling plant.
- Delivery sequence to be issued before mobilisation and weekly delivery schedules issued for following weeks work
- Works will be segregated for plant and people interface. Designated crossing points will be in place. No vehicles will drive into exclusion zone work areas

6 Site Layout

Site layout and GR (SJ874470). *To be updated with logistics plan (working progress)*



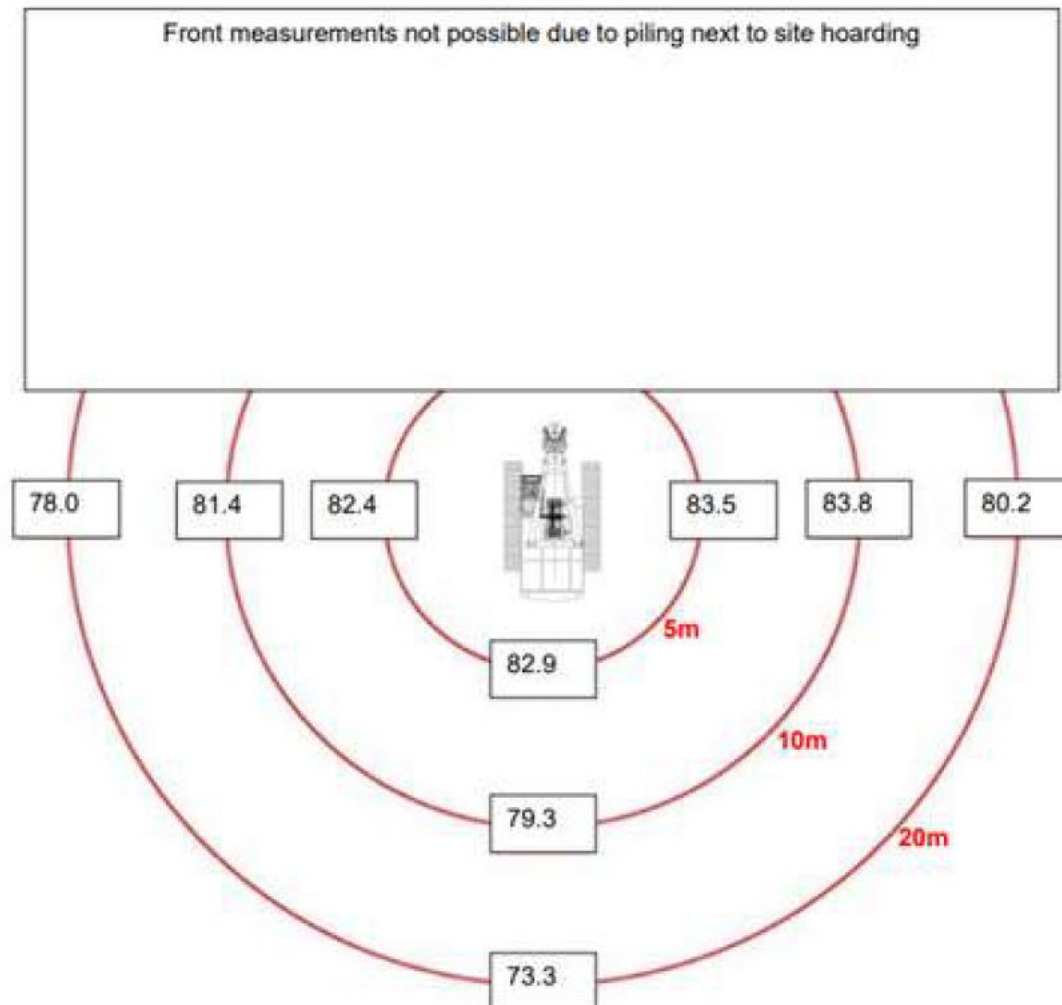
7 Control of Site Hazards

Identify significant site hazards (significant hazards are those where the risk from the hazard is considered to be significant). Typical site hazards may include buried services, limited clearances, infrastructure risks, in-tunnel risks, etc. These are to be included in the Risk Assessment pack

Site specific hazards will be noted within the Site Hazard Assessment completed during the prestart site visit or on arrival by our Supervisor. A copy of the form is included in Appendix A.

Noise Assessments have been carried out on the Piling Rig on previous sites, and an example is shown below. Its important to state that all sites are different when it comes to noise levels, noise monitoring is present on site (by [REDACTED] along the site boundary.

Due to the nature of Stoke Etruria site the piling area will be a hearing protection zone.



HAVS Assessment has been undertaken by the rig manufacturer in regard to the exposure of the operator and has been included below. The exposure levels exhibited negate the need for any additional limitations or control measure to be implemented



Noise		
Sound pressure level in cab c/w Tier 4f Engine	109 dB	109 dB
Sound power level c/w Tier 4f Engine	71 dB	71 dB
Vibration transmitted to the hand-arm system of the machine operator	< 2.5 m/s ²	< 8.2 ft/s ²
Vibration transmitted to the whole body of the machine operator	< 0.5 m/s ²	< 1.64 ft/s ²

In accordance with client procedures, Personal Vibration Exposure is to be recorded on form FM-HSE-V01-01 with a Vibration Assessment also to be undertaken and recorded on FM-HSE-V01-03

Daily noise assessments are also to be undertaken and recorded on the Personal Noise Dose Monitoring Form FM-HSE-N01-01. The completed assessment forms are to be submitted to site management team on a daily basis for review

8 Communication & Contact Details

Contact Details:

Name	Position	Contact Number

Principal Contractor Contact Details:

Name	Position	Contact Number

9 Emergency Arrangements

Supervisors are trained First Aiders who will assess and provide minor treatment. If required, the injury may be taken to the nearest A&E Department. All incidents will be recorded in site Accident book.

Emergency contact number:

A route map to the nearest A&E is included in Appendix C and a copy of this should be displayed on the notice board in the site office.

Nearest A & E Address: Royal Stoke University – Newcastle Road – Stoke-On-Trent – ST46QG

Hospital Map shown in Appendices section 17.3

9.1 Interfaces

Public

Hoarding/similar to be provided by principal contractor and access to site should be restricted. Personnel to be aware of public when banking delivery wagons etc. off the highway onto site and should be aware of proximity to site boundaries while piling. Where possible, wagons will drive forwards on and off site. As there is a public footpath running adjacent with the site boundary, additional care should be given in relation to this interface ie. Additional Banksman and separation barriers where appropriate

Other trades & construction site vehicles



Use pedestrian walkways and dedicated plant crossing points – Managed by

Environment



Statutory and Enforcement Authorities

No noisy plant to be used before 8am. TBC

10 Environmental

10.1 Project Impact Assessment

Prior to commencement of a project the following Environmental Aspects shall be taken into consideration and appropriate controls implemented to reduce any associated impact. Where applicable these will be documented with the project specific risk assessment.

- Surrounding ground conditions and topography
- The nature of the site processes and any excavations
- Watercourses, rivers and streams flowing through or near the site
- Sensitive downstream receptors
- Potential for runoff water
- Local drainage arrangements, manholes, catch pits
- Location of offices, stores and welfare facilities
- Waste disposal, including effluent
- Maintenance facilities, wheel washes and vehicle cleaning
- Fuel storage, refuelling and drip trays
- Access roads, hard standings and car parks
- On-site concrete plants
- Concrete truck / grout plant wash-down
- Dewatering
- Coal measures. Gas monitors to be in place for piling.

10.2 Pollution Prevention

Storage of Liquid in Drums - Fuels, Oils, and COSHH substance drums will be stored within a drip tray capable for holding 25% of the total capacity. If the drums stored have a total capacity in excess of 200L then they must be bunded to 110% of the total volume. The container will be clearly labelled as to the contents.

Storage and Use of Fuel Cans: Ensure that vessels used are appropriate for the fuel and that caps are securely fitted when not in use and they are restrained for transport.

Use of plant nappies or drip trays will be utilised across the site for items of static plant, fuel and COSHH substances.

Spill Control - Spill control kits will be located in the vicinity of fuel stores / refuelling points.

Each major plant item will carry its own spill kit where possible. For some business units these will be mobilised to site in the stores.

If a spill occurs on site – this will be contained immediately using spill kits / sand / earth bunds etc. and further leakage will be prevented i.e. close valve, right an up turned oil drum etc.

A check will be made to ensure any spill has not reached any nearby drains, manholes, watercourses or other sensitive areas. If required any pathways will be dammed and any receptors bunded to prevent subsequent contamination

Spills will be reported in accordance with [REDACTED] procedure 1- 3.1K Reporting & Investigating Incidents and reported to the PC.

The following information will be included in the report -

- Material involved and pollution properties if applicable
- Location
- Whether it is in danger of entering drainage / watercourses
- Quantity involved
- Reason for spillage / responsibility

Any material used to clean up a spill will be collected and disposed of as hazardous waste

10.3 Waste Management

Responsibility for Waste Management on site will be in accordance with the subcontract agreement.

Where applicable [REDACTED] will comply with Section 34 of the Environmental Protection Act (EPA) duty of care.

The EPA places a duty on any person who imports, produces, carries, keeps, treats or disposes of controlled waste or, as a broker has control of such waste, to take measures to: prevent the unauthorised or harmful deposition, treatment or disposal of waste and prevent the escape of the waste from his control or that of any other person

Where applicable [REDACTED] will ensure that the transfer is only to an authorised person or to a person authorised for transport purposes.

Where contaminated waste cannot be disposed on site, in agreement with the client, [REDACTED] will arrange disposal with a registered waste carrier or transport small quantities themselves with a relevant waste consignment note. <https://www.gov.uk/government/publications/hazardous-waste-consignment-note>

Waste will be segregated and disposed of in accordance with the Clients arrangements as agreed.

10.4 Unexpected Contaminated Land

Where contamination is unexpectedly discovered on a work site i.e. Asbestos, the following approach should be taken:

Engage the Stop Work Authority and immediately notify a Line Manager and the Environmental Manager;

Review and revise applicable SSOW and ensure that all appropriate controls are implemented and that site personnel are wearing the correct PPE.

10.5 Coal Seams.

Overview.

It's understood from the borehole data provided that within the footprint of the Vale 1 shaft we could potentially meet coal seams (intact/unworked). Summary of depths from approx. PPL of 123mOD are shown below. (Extract take from the Wardell Armstrong CS/KW/ST20093/0003)

BH501

- 16.3m to 16.82m (0.52m thickness).
- 30.47m to 30.65m (0.18m thickness).
- 59.75m to 60.22m (0.47m thickness).
- 60.70m to 60.75m (0.05m thickness).

BH502

- 20.95m to 21.22m (0.27m thickness).
- 29.45m to 29.65m (0.20m thickness).
- 33.7m to 34.74m (1.04m thickness).

BH503

- No coal encountered.

The Bored Pile Length is 26.5m from a PPL of 123mOD.

The Risk Assessment Report produced by the Coal authority has stated that they do not have any records of mine gas at this site. However, any future intrusive works do have the potential to

displace my gas.

Rotary Drilling with Segmental Casing.

██████ will be installing the piles using thick wall segmental temporary casings. The casings will seal any seams as we progress the casing into the ground.

██████ will ensure that the correct configuration of casing is used to ensure that the casing is installed past the seam, and that the boring process is not paused at or just above the levels previously mentioned.

If coal is encountered at the base of the bore will over dig by 0.5m and remove the coal before cage installation.

Spontaneous Combustion

Spontaneous combustion of coal is the process where coal catches fire without an external heat source. Spontaneous combustion usually occurs in coal because of air flowing over it. Coal will oxidise in the presence of air releasing carbon dioxide and importantly, heat. Where the flow of air is insufficient to carry away the generated heat the coal will warm and increase the rate of oxidation. In this way the coals temperature can increase until it auto ignites. However, where the air flow is very low there will be insufficient oxygen for oxidation and the process will be stopped. The process of spontaneous combustion therefore requires sufficient air to allow oxidation/combustion, but not so much as to cool the coal

- 1- Ground monitoring to be undertaken by ██████ throughout the works to identify any potential ground gases
- 2- Multi Rae gas monitors or similar will be utilised for the duration of the works these will detect the 5no gases of concern within the underlaying ground strata. Note see the trigger & action levels below
 - Carbon Monoxide
 - Hydrogen Sulfide
 - Methane
 - Oxygen
 - Carbon Dioxide

MultiRae Lite Gas monitor calibration certs – calibrated

Gas	Span	Units	Bump Test	Units
CO2	5000.0	ppm	5000.0	ppm
O2	18.0	%vol	18.0	%vol
CO	50.0	ppm	50.0	ppm
H2S	10.0	ppm	10.0	ppm
CH4	2.2	%vol	2.2	%vol

HSE EH40:2005 alarm levels for STEL and TWAs Guide lines exposure limits

Gas	TWA	STEL	Instant Low Alarm	Instant High Alarm
CO2	5000ppm	15000ppm	15000ppm	20000ppm
CO	20ppm	100ppm	100ppm	200ppm
H2S	5ppm	10ppm	10ppm	20ppm
O2			19.5%vol	23.5%vol
LEL CH4			10%LEL	20%LEL

The gas monitor is to be used in accordance with MRA's guidance, these are to be fixed as close to the borehole as possible typically attached to rig operators so any gasses can be detected. Note. If exposure levels activate the Gas Monitor, then works must "Stop" with the ██████ Emergency procedure followed

- 3- Muck away created from the works will be removed away from the working area

and stored in a designated stockpile. This will be monitored by [REDACTED] making sure no ground gases are present and for any contaminants

- 4- Daily briefings will be undertaken between [REDACTED] and [REDACTED] making sure all operations are discussed, making sure all operatives are aware of the tasks to be undertaken.

11 Briefing

11.1 Briefing Arrangements

The site supervisor will ensure all [REDACTED] site personnel receive the following briefings:

- Site Induction (principal contractor/client)
- Works Package Plan
- Daily Briefing
- Toolbox Talks (To Keller schedule)

Reference to be made to Work Instructions where appropriate.

The image shows a 'Toolbox Talk Attendance Register' form. It includes fields for Project Name, Site Address, Project Name (Toolbox Talk), Date, and Location of the Toolbox Talk. Below these is a table with columns for Name, Signature, and Date. The form is designed to be filled out for each toolbox talk session.

12 Welfare

All welfare facilities are to be provided by the principal contractor and must include as a minimum:

- Toilets
- Hot running water
- Cold drinkable water
- Canteen area for preparation of food
- Covered rest area to include seating
- Drying room



13 PPE

As a minimum, the following PPE will be made available to all personnel attending site:

 Safety Helmets	 High Visibility Clothing or Vest	 Foot Protection	 Hand Protection	 Safety Glasses	 Hearing Protection	 Safety Harness
EN 397:2012	EN ISO 20471 – Min Class 2	EN ISO 20345 – Min S5	EN 388 – Mechanical EN 374 - Chemical	EN 166 – Min Grade F	Task Specific	Task Specific
					TASK SPECIFIC	TASK SPECIFIC

Safety Harnesses for the piling rig masts will be worn for the rigging up of the machine and also general maintenance tasks where required. Safety harness must be clipped on to designated attachments points in the MEWP at all times whilst access platform is in use.

14 Working At Height

All operators conducting duties with the use of the MEWP shall be in accordance with the manufacturers operating instructions at all times. All operators shall be IPAF qualified.

During operations, all trained occupants in the platform will wear a lanyard and safety harness to the authorised anchorage points. 6 monthly thorough examination certificates will be provided,

The MEWP is required during rigging up to connect augers, and to attach the bagged concrete hoses to the swan neck of the rig. It will also be used when undertaking the daily checks and maintenance on the rig where working at height is required.

A separate Lift Plan will be provided and briefed alongside this WPP.



15 Working Hours

(Should the concreting process start it has to be complete. If there is an issue with supply there may be the below timing may be exceeded. [REDACTED] are to co-ordinate the timing of the concreting to reduce the risk.

[REDACTED] site working hours will be:

Monday to Friday
Saturday

08:00 to 18:00
Prior to agreement



16 Handover of completed works

Daily Report Sheet detailing the pile No's completed, their lengths and diameters, cube samples taken and any relevant pictures will be completed by [REDACTED] Supervisor and issued daily

17 Appendices

17.1 Site Hazard Assessments

17.2 Working Platform Certificate

17.3 Hospital Route Map

17.4 Site Plans & Sequence Stages.

17.5 Rig Details

18 Detailed Methodology

18.1 Installation of piles

HOLD POINT: Ensure the working platform certificate and permit to dig are signed and issued by the principal contractor / client and the working area is adequately segregated from other trades.



Signage to be placed to denote work area



HOLD POINT: Permit to load, working platform certificate, gas monitor and piling platform inspection required prior to piling rig or crane being off loaded from transport and rigged.

Each pile location will be set out by (TBC) using total station surveying equipment with the pile centre coordinate information easting and northing for each pile input onto the surveying equipment prior to the works commencing.

The piling rig is moved to the pile location under instruction of the piling rig attendant and a "controlled exclusion zone" established around the piling rig to prevent unauthorized access into the piling area using barriers.

The exclusion zone will be controlled and managed by the rig attendant. Gas monitor in place and working



If required, a pilot hole will be drilled at the pile location so that the casing can be lifted into position.

HOLD POINT: Prior to any lifting operations commencing, and approved lift plan must be in place. The details of all lifts must be included within the schedule of common lifts section of the approved lift plan for the lifting appliance used i.e. crawler crane, piling rig auxiliary line etc and the lift plan is to be briefed to the lifting team by the Lift Supervisor.

Casing will be lifted by the attendant crane in accordance with the approved lift plan. If the crane is not available or is unable to access the area to lift the casings then the spare line on the Rig or the bar will be used to lower or stand up casing within the piling exclusion zone. Lifts will be controlled by the slinger signaller with the Crane Supervisor in attendance.

If using slip casing, the single casing length will be attached to the piling rig and then placed into the pilot hole and then screwed into the bore position using a

	twister bar. If using segmental casing, as above the lead casing will be attached to the piling rig casing driver and then screwed into the bore position. Additional casing lengths will be lifted in by the attendant crane and added until the casing is sealed into stable strata and the bore advance with digging tools. The casing will protrude a minimum 1m above PPL at all times.
	The lead casing, approximately 2-6m in length, will be attached to the piling rig and then screwed into the bore position. Additional casing lengths of varying sizes will then be added to support the near surface strata. Once the required length of casing has been installed the bore will be excavated to toe using augers / buckets as required. The casing will always protrude a minimum 1m above PPL. The drilling tool will 'spin off' the spoil generated from the excavation process into a restricted zone within the controlled area of the working platform. The spoil is then scrapped up using the attendant excavator, then transported to the local stockpile using a dumper truck. The banksmen will position the rig to ensure that spoil is not obstructing walkways or access roads. A bund, formed by the excavator using the initial dry pile arisings, will be used to contain any water that is removed from the bore by the drilling and cleaning buckets during the drilling process. Sufficient water to be supplied/available (volume sufficient to fill bore) by client in case the pile requires flooding. If the pile is wet, then the client is to provide an area and means to pump the water to a settlement tank or approved area etc. During the excavation process it will be necessary to change digging tools, this operation will be done using the site attendant crane to move the tool to the rig and the service winch on the piling rig to connect the tool to the [redacted] bar stub.
	The last 500mm of the bore is excavated to toe level using the cleaning bucket. As per ITP, checks for the final depth and base hardness will be undertaken and agreed. When the as built depth is measured the cage feet lengths will be calculated and fitted to the bottom cage section If all checking parameters are met in accordance with the ITP, then installation of the reinforcement cage will commence.



The designed reinforcement cage will be fabricated at an off-site facility and delivered to site in either single or 2 no sections depending on the pier location. Prior to installation the foam positioning on the bars will be checked.

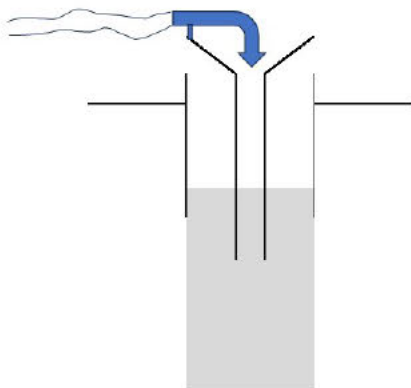
The attending crawler crane will be used to lift the cage sections from horizontal to vertical and install into the bore in sections, as identified within the approved relevant Lift Plan

The bottom section of cage will be fitted with cage feet to regulate the final top of cage level. The cage section will be 'trapped off' on the segmental casing using tea pots / trapping bar.



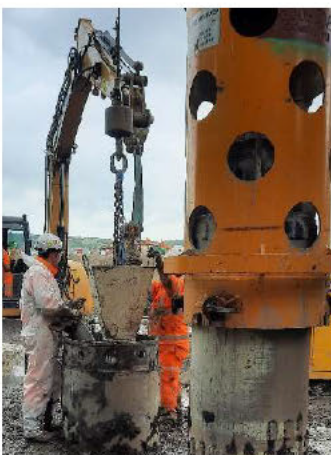
The upper sections of reinforcement cage will then be lifted onto the first section and the cages will be joined together using Quick Splice clamps attached to the splice band. This process is repeated until the cage is fully assembled.

The whole cage will then be rotated to a consistent bearing and lowered to the base of the pile. The final elevation of the cage will be checked and adjusted if required. The chains are then removed from the cage and lifted clear. Pile cages incorporating sonic tubes will be filled with water.



Before concreting, if the pile bore contains water, vermiculite is placed down into the hopper into the tremie pipe, to create a separation layer between the water and concrete to be discharged down the tremie pipe. The height of the bag shall be at least two times the diameter of the tremie pipe.

Ready mix concrete will then be poured into the top of the tremie centralising hopper, attached to a full length tremie pipe to the toe of the pile. As the concrete levels rises, the tremie and casing sections are gradually removed as per the ITP yet be adequately always embedded during the concreting process. The tremie embedment will always be minimum 3m and maximum 10m. and the casing will be removed using the piling rig or casing extractor. Any water in the bore will be pumped away by [REDACTED] as the concrete rises to suitable storage tanks for disposal.



Once the contaminated concrete at the concrete/water interface has been flushed out and only homogenous concrete can be seen at the head of the pile, the remaining casing will be extracted using the piling rig or casing extractor. The piling rig may need to apply some slight rotation from side to side when extracting the segmental casing if the friction forces are particularly high, however will attempt to straight pull in the first instance. The concrete will be topped up as required in between splitting of the casing before the lead casing is



finally extracted.

Concrete will be cast to piling platform level (TBC) and covered using a pile cover until the concrete has set.

Concrete sampling, testing and cube specimens will be taken as per the ITP

18.2 Setting Out Requirements – Toolbox Talk.

Drawings updates must reviewed within 3 working days of receipt. Within this review a check of the pile layout against the co-ordinates will be undertaken, with a list of anomalies provided.

The setting out engineer is to keep ahead of the rig at all times, following the instruction of the [REDACTED] Supervisor who will provide a daily list of the piles we are going to install the following day in advance.

Piling Platform level checks are to be carried out while the rig is being rigged up. This should be done before any piles are installed and confirmed to the [REDACTED] PM. They should then be undertaken daily and checked with the Supervisor.

As soon as the rig completes the concreting phase the engineer must take an as-built reading of the pile position, before the cage is inserted.

If the pile is out of tolerance, the [REDACTED] Supervisor is to be informed immediately. The engineer should then send a sketch to the PM, complete with as built co-ordinates and reasoning for the pile not being in position by the end of the day.

If the pile is within tolerance, the cage is inserted with a second as-built is to taken on the pile - this should be taken from the centre of the concrete, not the centre of the cage, recording X,Y co-ordinates.

Once the cage is inserted, the top of steel height is to be recorded.

As-built records MUST be carried out on EVERY pile and issued to the [REDACTED] project manager daily if any are non-conformant or weekly otherwise.

Pins must be set out before the end of the day for the next day.

Prior to leaving site at the end of shift, the setting out engineer must complete a check of piles installed with the [REDACTED] supervisor. They will compare and ensure that their lists are the same, marking off the pile references on the site cabin wall drawing.

Reinforcement Checks note:

It is the responsibility of all on site to ensure that they know exactly where the cage is within the pile and that the cage remains in its correct position. An automated staff will not be used by any [REDACTED] operative at all in any stage of the operation. When there is a concern that reinforcement may sink in the pile, the following actions will be taken:

1. At the end of the shift, piles completed before 3pm that day will be inspected by the supervisor and the setting out engineer, to ensure the cage is visible and that they remain in the correct position. The engineer is to record seeing the cage in their as built record.
2. For all piles completed after 3pm, the cage will be trapped by the [REDACTED] supervisor. There is then to be an inspection by the supervisor and the setting out engineer the next morning, to ensure the cage is in the right position. If not, the PM/CE must be notified immediately. If the cage is visible, the engineer is to record seeing the cage in their as built record.



Figure 1- Example of correctly trapped cage

18.2.1 Attendances

- Setting out pins.
- Project Drawings in the correct format, electronically provided to enable a

review of the pile positions.

The setting out engineer is part of the RBP team and signed up to [REDACTED] RAMS. [REDACTED] will provide this HSEQ documentation

Welfare is also to be provided.

If there are queries, contact your Project Manager.

Remember Everyone is a Leader when it comes to Quality, so if you are not sure stop the operation and check.